9th Class 2019		
Biology	Group-II	Paper-I
Time: 1.45 Hours	(Subjective Type)	Marks: 48

(Part-I)

Q.2. Write short answers to any FIVE (5) questions: (10)

(i) Define parasitology.

Ans **Parasitology:**

This branch deals with the study of parasites.

(ii) Differentiate between community and population.

Ans

Community	Population
1. A community is an assemblage of different populations, interacting with one another within the same environment.	1. A population is defined as a group of organisms of the same species located at the same place, in the same time.
2. A forest maybe considered as a community.	2. Human population in Pakistan in 2010 comprises of 173.5 million individuals.

(iii) Write down the name of main steps of biological method.

Ans In solving a biological problem, biologist takes following steps:

- Recognition of biological problem
- Observations
- Hypothesis formulation
- Deductions
- Experimentation
- Summarization of results (create tables, graphics, etc)
- Reporting the results

(iv) Write two observations of A.F.A. King.

Ans Some important observations of King were:

1. People who slept outdoors were more likely to get malaria than those who slept indoors.
2. Individuals who slept near a smoky fire usually did not get malaria.

(v) Describe two properties of kingdom fungi.

Ans **Kingdom fungi:**

It includes eukaryotic multicellular heterotrophs which are absorptive in their nutritional mode *e.g.*, mushrooms.

1. Most fungi are decomposers.
2. They live on organic material, secrete digestive enzymes and absorb small organic molecules formed by the digestion by enzymes.

(vi) Write down the name of two endangered species in Pakistan.

Ans The names of two endangered species in Pakistan are as follows:

1. Indus dolphin 2. Marco Polo sheep

(vii) Describe two functions of cell membrane.

Ans Following are two functions of cell membrane:

1. Cell membrane functions as a semi-permeable barrier, allowing a very few molecules across it while fencing the majority of chemicals inside cell. In this way, cell membrane maintains the internal composition of cell.
2. Cell membrane can also sense chemical messages and can identify other cells.

(viii) Write two functions of lysosomes.

Ans The two functions of lysosomes are as follows:

1. Lysosomes contain strong digestive enzymes and work for the breakdown (digestion) of food and waste materials within cell.

2. Lysosome fuses with the vacuole that contains the targeted material and its enzymes break down the material.

Q.3. Write short answers to any FIVE (5) questions: (10)

(i) Define karyokinesis and cytokinesis.

Ans The process of mitosis is complex and highly regulatd. There are two major phases *i.e.*, the division of nucleus known as karyokinesis; and the division of cytoplasm known as cytokinesis.

(ii) Differentiate between apoptosis and necrosis.

Ans

Apoptosis	Necrosis
1. Apoptosis is one of the main types of programmed cell death.	1. Necrosis is the accidental death of cells and living tissues.
2. During apoptosis, cell shrinks and becomes rounded due to the breakdown of cytoskeleton by enzymes.	2. During necrosis, there is a release of special enzymes from lysosomes.

(iii) What is meant by alternation of generation?

Ans Plants' life cycle shows alternation of generations. The cells of diploid sporophyte generation undergo meiosis to produce haploid spores, which grow into haploid gametophyte generations. Gametophyte generation produces haploid gametes through mitosis. The gametes combine to produce diploid zygote. Zygote undergoes repeated mitosis to become diploid sporophyte.

(iv) What is meant by active site in enzyme?

Ans Only a small portion of enzyme molecule is directly involved in catalysis. This catalytic region is known as active site. It recognizes and binds substrate and then carries out reaction.

(v) **Differentiate between prosthetic group and co-enzyme.**

Ans Differences between Prosthetic group and Co-enzyme

Prosthetic Group	Co-enzyme
If organic cofactors are tightly bound to enzyme, they are called prosthetic groups	If organic cofactors are loosely attached with enzyme, they are called co-enzymes.

(vi) **Differentiate between aerobic and anaerobic respiration.**

Ans Differences between Aerobic and Anaerobic respiration

Aerobic respiration	Anaerobic respiration
1. It occurs in the presence of oxygen.	1. It occurs in the absence of oxygen.
2. Glucose is completely broken down to release CO_2 and water.	2. Glucose is incompletely broken down to release the product in the form of lactic acid or ethanol.
3. Energy is released in large amount.	3. Energy is released in less amount.
4. It takes place in the cytoplasm as well as in mitochondria.	4. It takes place only in the cytoplasm.

(vii) **Write down the three subunits of ATP.**

Ans Each ATP molecule has three subunits:

1. Adenine -- a double-ringed nitrogenous base;
2. A ribose -- a five-carbon sugar; and
3. Three phosphate groups in a linear chain.

(viii) **Differentiate between photosynthesis and respiration.**

Ans

Characteristics	Photosynthesis	Respiration
Metabolism	Anabolism	Catabolism
Energy investment / production:	Investment of light energy to store it in	Bond energy transformed into

	the form of bond energy.	chemical energy of ATP.

Q.4. Write short answers to any FIVE (5) questions: (10)

(i) What is the role of magnesium in plants?

Ans Magnesium is a structural component of chlorophyll. It is also necessary for the functioning of plant enzymes to produce carbohydrates, sugars and fats. It is used for fruit and nut formation and essential for germination of seeds. Deficiency of magnesium causes yellowing and wilting of leaves.

(ii) Describe the causes of ulcer.

Ans The causes of ulcer include excess acid, infection, long-term use of anti-inflammatory medicines (including aspirin), smoking, drinking coffee, colas, and eating spicy foods.

(iii) What is chyme?

Ans The strarch in our bite of bread and the protein in mutton have been partically digested and the food has been converted to a soup-like mixture called **chyme**. After it, the pyloric sphincter allows a little mass of chime to enter duodenum.

(iv) Differentiate between saturated and un-saturated fatty acids.

Ans

Saturated fatty acids	Unsaturated fatty acids
1. Saturated fatty acids have all of their carbon atoms bonded to hydrogen atoms.	1. Unsaturated fatty acids have some of their carbon atoms double-bounded in place of a hydrogen atom.
2. Lipids containing saturated fatty acids are solid at room temperature.	2. Lipids containing unsaturated fatty acids are liquid at room temperature.

(v) How does wind (air in motion) affect the rate of transpiration?

Ans Wind (air in motion) carries away the evaporated water from leaves and it causes an increase in the rate of evaporation from the surfaces of mesophyll. When air is still, the rate of transpiration is reduced.

(vi) What is blood? Write the name of its parts.

Ans Blood is a specialized body fluid (a connective tissue) that is composed of a liquid called blood plasma and blood cells. The weight of blood in our body is about $1/12^{th}$ of our body. The average adult body has about 5 litres of blood.

In a healthy person, plasma constitutes about 55% by volume of blood. And cells or cell-like bodies are about 45% by volume of the blood.

(vii) Differentiate between pulmonary circulation and systemic circulation.

Ans

Pulmonary circulation	Systematic circulation
The pathway on which deoxygenated blood is carried from heart to lungs, and in return, oxygenated blood is carried from lungs to heart, is called pulmonary circulation.	The pathway on which oxygenated blood is carried from heart to body tissues, and in return, deoxygenated blood is carried from body tissues to heart, is called systemic circulation.

(viii) Write the name of organism which transmits dengue fever.

Ans Dengue fever is spread through the bite of the female mosquito (Aedes argypti).

(Part-II)

Note: Attempt any TWO (2) questions.

Q.5.(a) Describe careers in biology of medicine / surgery and horticulture. (4)

Ans The following are the careers that a student of biology can plan to adopt:

Medicine / Surgery:

The profession of medicine deals with the diagnosis and treatment of diseases in human. In surgery, the parts of the body may be repaired, replaced or removed, for example, the removal of stones through renal surgery, transplantation of kidney, liver, etc. Both these professions are studied in the same basic course (MBBS) and then students go for specializations.

Horticulture:

Its deals with the art of gardening. A horticulturist works for the betterment of existing varieties and for the production of new varieties of ornamental plants and fruit plants. Biology students can adopt this profession after their higher secondary education.

(b) Define compound tissues and explain compound tissues found in vascular plants. (5)

Ans **Compound Tissues:**

A plant tissue composed of more than one type of cell is called a compound or complex tissue. Xylem and phloem tissue, found only in vascular plants, are examples of compound tissues.

1. Xylem Tissue:

Xylem tissue is responsible for the transport of water and dissolved substances from roots to the aerial parts. Due to the presence of lignin the secondary walls of its cells are thick and rigid. That is why, xylem tissue also provides support to plant body. Two types of cell are found in xylem tissue *i.e.*, vessel elements and tracheids. Vessel elements or cells have thick secondary cell walls. They lack end walls and join together to form long tubes. Tracheids are slender cells with overlapping ends.

2. Phloem tissue:

Phloem tissue is responsible for the conduction of dissolved organic matter (food) between different parts of plant body. Phloem tissue contains sieve tube cells and companion cells. Sieve tube cells are long and their walls have small pores. Many sieve tube cells join to from long sieve tube. Companion cells make proteins for sieve tube cells.

Q.6.(a) Explain mechanism of enzyme action. (4)

Ans For Answer see paper 2015 (Group-I), Q.7.(a).

(b) Explain mechanism of respiration. (5)

Ans **Mechanism of respiration:**

The process of respiration involves complex series of reactions. For the study of all the reactions of glucose oxidation, we will go into the mechanism of aerobic respiration.

Aerobic respiration is a continuous process, but for convenience we can divide it into three main stages:

1. Glycolysis 2. Krebs cycle
3. Electron transport chain.

Glycolysis occurs in cytoplasm and oxygen is not involved in this stage. That is why, it occurs in both types of respiration *i.e.*, aerobic and anaerobic. In glycolysis, glucose (6C) molecule is broken into two molecules of pyruvic acid (3C).

In Krebs cycle, the pyruvic acid molecules are completely oxidized, along with the formation of ATP, NADH and $FADH_2$. Before entering in Krebs cycle, pyruvic acid is changed into a 2-carbon compound called acetyl-CoA.

Electron transport chain is the final step of cellular respiration. It is the transfer of electron on an electron transport chain. In this step, NADH and $FADH_2$ release electrons and hydrogen ions. These electrons are taken

up by a series of electron carriers. When electrons move through the series of electron carriers they lose energy, which is used to synthesize ATP. At the end of chain, electrons and hydrogen ions combine with molecular oxygen and form water.

Q.7.(a) Write the importance of fertilizers in detail (4)

Ans For Answer see paper 2016 (Group-II), Q.7.(a).

(b) How uptake of water and ions take place in plants? (5)

Ans In addition to anchoring the plant, roots perform two other vital functions. First, they absorb water and salts from soil. Second, they provide conducting tissues for distributing these substances to the tissues of stem.

The conducting tissues (xylem and phloem) of root are grouped in the centre to form a rod-shaped core. This rod extends throughout the length of root. Outside the conducting tissues, there is a narrow layer of thin-walled cells, the pericycle. A single layer of cells *i.e.,* endodermis surrounds this pericycle. External to this, there is a broad zone of **cortex**. It consists of large and thin-walled cells. Cortex is bounded on outside by a single layer of **epidermal** cells. Roots also have clusters of tiny **root hairs**, which are actually the extensions of epidermal cells.

Root hairs provide large surface area for absorption. They grow out into the spaces between soil particles where they are in direct contact with water. The cytoplasm of root hairs has higher concentration of salts than soil water, so water moves by osmosis into roots hairs. Salts also enter root hairs by diffusion or active transport. After their entry into root hairs, water and salts travel through intercellular spaces or through cells (via channels, called plasmodesmata) and reach xylem tissue. One in xylem, water and salts are carried to all the aerial parts of plant.